Public Library Space Needs: A Planning Outline / 1998

Anders C. Dahlgren

Consultant for Public Library Construction and Planning

Wisconsin Department of Public Instruction
John T. Benson, State Superintendent

Introduction

This outline is intended to help librarians and library trustees determine whether to initiate a facilities planning process. By completing it, librarians and trustees can obtain a general estimate of their library's space needs based on their library's underlying service goals. With that estimate, planners can assess the adequacy of their library's existing overall square footage and determine if a more detailed study is called for.

The process described in this outline evolved from a simple concept—that library space needs are based on what a library must house in order to serve its community adequately. The things a library must house to meet its community's needs all have identifiable spatial requirements. Determine the library's inventory and its space needs follow.

This outline defines six broad types of library space—collection space, reader seating space, staff work space, meeting space, special use space, and nonassignable space (including mechanical space). It suggests how library goals relating to each of these areas can be projected to meet future needs and provides a way to translate resulting service assumptions into space needs.

In brief, the process outlined involves the following steps.

- Identify the library's projected service population, known as the design population.
- Estimate the collection inventory the library will provide to meet future service requirements and calculate how much floor space is needed to house that projected

- Estimate the number of seats the library will need to accommodate in-house use of the collection and how much floor space these seats will require.
- Estimate the number of staff work stations that will be necessary to support the staff's projected routines and how much floor space they will require.
- Estimate the type and capacity of meeting rooms that the library will need and how much floor space these will require.
- Calculate an allocation for miscellaneous public- and staff-use space (called special use space).
- Calculate an allocation for vestibules, furnace rooms, rest rooms, and other types of nonassignable space.
- Assemble the estimates for the six types of space into an overall estimate of space need.

Calculating the needs for these broad types of space quantifies by far the largest share of a library's overall projected space needs. If the result suggests there is a need for an expanded building, further, more detailed study can refine this space needs assessment and provide local planners with even stronger arguments in support of the need. This outline simplifies the mechanism for assessing a library's space need and does not presume to produce an exhaustive estimate of space needs. Many factors affecting service projections and space needs are beyond the scope of this short publication.

Library planners must also acknowledge that availability of space, or lack of it, is not the sole reason for examining physical facilities. The need to improve energy efficiency and the condition of heating, ventilating, and air conditioning systems; to insure handicapped accessibility; to adapt to meet the electrical and telecommunications requirements of tomorrow's library technologies; and to assess the general effectiveness of the work flow are other suitable reasons for examining the structure that houses a local library.

This outline requires use of data that should be readily available to local planners—annual circulation, total holdings, and so on. If a particular data element is not available—proportion of resident to

nonresident circulation, for instance—it is well within the spirit of this process to make a reasonable estimate of the missing data (perhaps noting the distinction between the service goals drawn from specific data and those drawn from reasonable estimates). A special data-gathering effort could be undertaken, or a sampling might provide useful information to incorporate here, but typically such efforts would involve more time and energy than this outline is meant to require.

Work space is provided throughout the text for calculations and notes. A work sheet is included in Appendix D to help with the calculation of a library's projected overall space need. Examples are also provided to illustrate how to make certain calculations, although the examples are *not* intended to recommend a specific library service level or planning assumption.

Preliminaries: Design Population

Planning for an effective library facility begins with determining the library's design population—identifying the population the expanded library will be expected to serve. Knowing the design population helps library planners calculate several of the service parameters used to assess space needs in the steps which follow.

There are two key factors to consider in establishing the design population. First, the design population should be a projection of the population in the library's service area. Since library buildings are an important capital investment for most communities, it is crucial that they be planned to respond to current *and future* needs. The recommended time frame for planning is 20 years.

Second, the design population should take into account the fact that the typical Wisconsin library serves an area that extends beyond the boundaries of the municipality in which it is located. The municipality may be considered the library's primary service area, but most public libraries serve individuals from beyond municipal boundaries by virtue of participation in a public library system or county library service or by virtue of reciprocal agreements with neighboring libraries. To ignore the service implications of traffic generated by these individuals would mean planning a facility that would be outgrown too quickly.

Estimates of the projected population for a public library's primary service area—typically the municipality itself—can often be obtained from the municipality, county, or from a regional planning commission. Local school districts may also be a source for such

projections (although the school district's service area may not coincide with the public library's service area).

To this forecast should be added an estimate of the library's nonresident service population. One simple way to estimate the nonresident population is based on the proportion of resident borrowing and the proportion of nonresident borrowing. If one assumes that residents and nonresidents tend to borrow material at roughly the same rate per capita, then the balance between resident and nonresident circulation reflects the balance between the resident and nonresident population. Furthermore, if one assumes that the proportion of resident to nonresident borrowing will remain constant for the duration of the 20-year planning time frame, one can use the current proportion of resident borrowing to calculate the library's projected, extended population—its design population.

For other discussions of calculating an extended service population for a public library, see the second edition of *Output Measures for Public Libraries,* the second edition of *Wisconsin Library Building Project Handbook,* Lee Brawner's *Determining Your Public Library's Future Size,* and Robert Rohlf's *Public Libraries* article. Full citations for these resources may be found in Appendix C.

Formula. To calculate a design population, divide the projected resident population by the percentage of resident borrowing.

Example. The current municipal population of Sampleville is 5,000. The public library's annual circulation is 75,000 items, of which residents borrow 50,000 items, or 66 percent. If a projected municipal population of 8,000 represents 66 percent of the design population, then the design population is 12,000 (8,000 ÷ 0.66 = 12,000).

Be aware that specific local conditions may suggest adaptations to these calculations. If the library doesn't report resident and nonresident borrowing separately, but does distinguish between resident and nonresident patron registration, the latter could possibly

be used as an alternative measure. If there is reason to believe the balance between resident and nonresident use will shift during the 20-year planning time frame, planners could apply their estimate of the *projected* proportion of resident use to calculate the design population.

Step 1
Collection Space

By projecting the library's collection size, planners can quantify the space needed to house the collection. A typical section of library shelving affords a specific amount of linear feet of shelving space, which in turn affords a certain capacity per shelving unit. Each shelving unit occupies a discrete amount of floor space, and so one can estimate the number of volumes that can be housed per square foot of floor space. Given this direct link between the size of the collection and the floor space required to house it, projection of collection size is one key to determining a library's space needs.

This outline covers four components commonly found in public library collections—books, periodicals, nonprint material, and digital resources. Other types of material, like microforms, are still found in many collections, but these are only treated indirectly under Step 1. See Step 8 for further refinements of these estimates. As with the projection of the library's service population, it is most effective to make these projections over a 20-year period.

Projecting Collection Size

Projections of collection growth should consider at least two factors:

- application of current standards for public library service (for example, *Wisconsin Public Library Standards);* and
- calculation of the library's rate of addition to the collection extended over the planning time frame.

Taken together, these factors can guide library planners as they develop a projection of collection size based on their understanding of a community's library service patterns, priorities, and needs. Standards can be used to suggest a minimum collection size; the library's rate of addition can be used to temper or redirect the recommendation of the standard.

Other factors may come into play as well. A system or county resource library may be obligated to maintain a larger collection than is recommended by the standards. The library's service emphases may also have an effect on collection size. Each library will also need to assess the impact of the growing availability of information by way of electronic and digital sources. Some libraries anticipate that electronic resources will slow the rate of growth in traditional collections or even reduce the quantities that will be needed in those traditional collections. Other libraries anticipate little effect. Still others anticipate that some parts of the collection (periodicals, reference holdings) will be affected substantially while other parts will be affected less dramatically.

The key to this step, as with every other step in the space needs assessment process, is the board and staff's understanding of local needs.

The application of a standard is a simple way to project collection size. *Wisconsin Public Library Standards* recommend that a local library can define appropriate service goals for growth in its print and nonprint collection through comparisons with other similar libraries. Each year's *Service Record* includes an analysis of rates of holdings for libraries in the state (see Appendix A). The analysis defines three levels of effort that a library may apply—basic, moderate, and advanced. Local planners should determine which level of effort is appropriate for the library and the community. Using the standards, an estimate of collection growth can be calculated based on the library's design population.

Formula. To calculate the recommended collection size using current standards, multiply the standard by the design population.

Example. Planners in Sampleville determined that a "moderate" level of effort regarding the book and nonprint collections was appropriate, but that a "basic" level of effort regarding periodicals was appropriate. Applying the 1996 *Service Record* analysis to a design population of 12,000, the Sampleville Public Library should plan for a collection of 40,560 volumes (at 3.38 volumes per capita), 122 periodical titles (at 10.18 titles per 1,000 population), and 1,405 recordings (at 117.12 per 1,000 population).

Some libraries may already meet or exceed these quantitative minimums, even when applying them to a design population. This could suggest that these libraries have no need to continue expanding their collections and should instead focus on weeding and developing present collections to optimum effectiveness. For other libraries, there may be unique local conditions suggesting that a larger collection is necessary to meet the needs of the design population, and other methods for projecting collection size may be explored.

Use the library's recent rate of addition as a check against the application of a standard. Consider both the library's gross rate of addition (annual additions only) and the library's net rate of addition (additions less withdrawals). By the time a library undertakes an assessment of its space needs, available shelf space may be at a premium, which could prompt an unusually high rate of withdrawals which would produce an artificially low—and potentially misleading—*net* rate of addition. Calculate the library's rate of gross and net addition as an average over a five or seven or ten year period. This will mitigate the effect of any unusually generous or restrictive years for acquisitions.

As these rates of addition are extended through the library's planning time frame, it creates a counterpoint to the application of a standard. The result may reinforce validate the standard, or it may lead staff and board to reexamine their forecasts for collection growth.

Formula. To project collection growth based on the library's rate of addition, multiply the average annual rate of addition by the duration of the planning time frame (typically 20 years); then add the result to the current collection size.

Example. The Sampleville Public Library's collection numbers 28,000 books. Over the last five years 3,550 volumes have been added and 925 volumes withdrawn. Net additions during that period have totaled 2,625. Gross additions have averaged 710 volumes per year; net additions have averaged 525 volumes per year. If the library sustains a rate of addition of 710 volume per year over the next 20 years, it will add 14,200 volumes, bringing its total holdings to 42,200 volumes. If the library extends its recent net rate of addition over the next 20 years, it will add 10,500 volumes, bringing its total holdings to 38,500 volumes.

Digital and electronic information resources constitute the final component of a library's collection resource. As more and more varied information becomes available in digital form, it becomes increasingly important for libraries to provide access to that material. The degree and type of access will be conditioned by the number of terminals that the library provides for patron use. The number of terminals the library provides will in turn determine how much space the library will need in support of this function.

Published formulas to calculate the number of terminals or computer work stations for the public can vary widely. In forecasting the number of stations the library will need to provide, it is important to consider

- daily traffic through the building, presently and in the future; some formulas suggest one terminal for every 20 visits while other recommendations suggest one terminal for every 10 visits (or even fewer)
- the kinds of environments that the library intends to create around its public computer stations (if the setting

will foster extended periods of patron use, additional terminals will be needed)

- the degree to which separate hardware platforms are needed to access different digital information resources (if several resources or databases can be accessed via the same computer station, the efficiency of this distribution pattern may also translate into a need for fewer terminals)
- the library's own direct observation of patron queues waiting for access to terminals presently on-site; and
- the experience of neighboring libraries regarding the number of terminals provided for the public.

In consideration of these factors, planners can make an estimate of the number of public computer stations or terminals will be needed. Note that any terminals provided in a computer training lab (if one is to be included in the library's plans) are tallied in Step 4, "Meeting Room Space." Also note that the immediate goal is to define the space needs for public computer stations now, and in the future. The library will not necessarily provide all of the stations immediately, but will grow into this space.

Calculating Collection Space

Once the size of the collection has been determined, the amount of space necessary to house that collection can be estimated.

Books

The number of volumes that can be stored in a given space may vary from five to 30 volumes per square foot, depending on several factors, including the height of the shelving, the width of the aisles, the type of material—for example, reference versus children's books—and so on. A general average for different types of material housed in different environments is ten volumes per square foot.

The estimate of ten volumes per square foot is predicated on housing a normal variety of adult trade books on full-height shelving 84 inches or 90 inches tall installed on five foot centers—that is, with a

three-foot aisle—and leaving the top and bottom shelves vacant for future expansion. A more rigorous estimate of shelving density for adult trade books using standard, full-height shelving is 15 volumes per square foot, which assumes using the top and bottom shelves. This outline recommends ten volumes per square foot instead as one means of compensating for needed spaces that may be overlooked because of the brevity of the assessment process described here.

The Americans with Disabilities Act currently specifies that the aisles in a library bookstack should be no narrower than 36"—but a 42" aisle is strongly recommended. These dimensions are both supported by the broad allocation of 10 volumes per square foot, although if the library prefers a 42" (or wider) aisle, the allocation allows for less of the compensation mentioned above. (Also note that the ADA currently states that in most parts of the collection, shelf height is unrestricted.)

Formula. To estimate the space needed to house the library's book collection, divide the total projected collection by ten.

As a variation on this formula, libraries that need to house a large print collection may wish to acknowledge the fact that a portion of the collection will be in circulation at any given time. If 10% of the collection is typically in circulation at any given time, the library could plan to provide shelf space for 90% of its entire collection. This, of course, leaves the library with less shelf space to manage its collection during the normal seasonal cycles of use.

Periodicals

Periodicals require two types of shelving—display shelving for current issues and storage shelving for back issues. Determine the number of periodical titles the library can anticipate carrying in the future, noting the recommendations that may be included in public library standards.

The Americans with Disabilities Act specifies that current periodical display shelving is subject to a height limitation. This affects

the number of titles that can be displayed clearly with the full cover exposed as well as the number of titles that can be housed per square foot. On average, one square foot of floor space is needed for each current issue displayed.

Next, determine the number of periodical titles for which the library will retain back files, and estimate the number of years that will ordinarily be retained. The library may or may not retain back issues for its entire subscription list. Many libraries are reducing the duration of their back files, as more of this material becomes available in digital form. Allow 0.5 square feet per title for every year retained.

> **Formula.** To estimate the space needed to display current issues of the library's periodical collection, divide the number of titles to be displayed by 1.0. For periodical storage, multiply the number of titles to be retained by 0.5, and multiply that product by the average number of years to be retained. Add these two figures together.

Nonprint material

For nonprint material, planners should project those holdings 20 years hence using the methods described above. Note recommendations that may be included in applicable public library standards. As with the book collection, once the size of the record and tape collection has been determined, the amount of space necessary to house that collection can be estimated. A general average is ten items per square foot.

> **Formula.** To estimate the space needed to house the library's nonprint collection, divide the total projected collection by ten.

Computer work stations

The appropriate allocation for a patron computer work station depends on the type of use the library wishes to encourage there. A smaller allocation is appropriate where a shorter patron stay is preferred (at a catalog terminal, for example). A larger space allocation

is appropriate where a patron is encouraged to spend longer periods at the computer. The actual space allocation, depending on the preferred use of the terminal, can range from a low of 25 to 30 square feet per terminal to 60 square feet or more.

On average, allow 50 square feet per public computer work station.

Formula. To estimate the space needed to house the library's public computer work stations, multiply the number of terminals by 50.

Examples. Planners in Sampleville projected that their collection should grow to 40,560 volumes according to the standards, 42,200 volumes at the current gross rate of addition, or 38,500 volumes at the current net rate of additions. They establish as their planning assumption a collection of 42,000 volumes and calculate that the book collection will require 4,200 square feet (42,000 ÷ 10).

Planners establish a periodical collection goal of 125 titles (slightly higher than the recommendation of the standard), of which 110 will be retained for an average of three years. Periodical display will require 125 square feet (125 ÷ 1). Periodical storage will require 165 square feet (110 * 3 * 0.5).

Similarly, they establish a nonprint collection goal of 1,500 items (again, slightly higher than the recommendation of the standard), requiring 150 square feet (1,500 ÷ 10).

After examining use patterns at Sampleville and the surrounding libraries, planners establish a service goal to provide 30 public computer stations, requiring 1,500 square feet.

The total collection space for Sampleville will be 6,140 square feet.

Step 2
Reader Seating Space

One common, broad recommendation is that a library should provide five reader seats for every 1,000 people in its service area. More detailed guidelines in other planning manuals usually suggest allocating reader seating on a sliding scale, decreasing the number of seats provided per 1,000 population as the total population increases.

The following reader seating schedule based on a library's design population is recommended for use with this space planning outline.

Population	Seats per 1,000 population
1,000	22.50
2,500	14.25
5,000	10.00
10,000	7.00
25,000	4.50
50,000	3.00
100,000	2.25
250,000	1.50
500,000	1.00

For a library with a design population that falls between these benchmarks, the recommended number of seats per 1,000 would be calculated somewhere between the respective seating recommendations. A library serving 22,000 people falls between the 10,000 and 25,000 benchmarks, and its recommended seating level should fall somewhere in the range of 7.00 and 4.50 seats per 1,000 population, say 4.90 seats per 1,000 population.

This recommendation only establishes a base or starting point for further consideration. Depending on a library's mission and service emphases, it may be appropriate to adjust the recommendation up or down. For instance, if a library's service profile emphasizes delivering popular materials, it may encourage patrons to browse through the collections and select material to be charged out and read at home; long-term in-house use may not be encouraged, and fewer seats may be required. Alternately, a public library that emphasizes a close collaboration with the local schools may specifically encourage long-term in-house use to support students working on assignments, and extra seating may be advantageous.

Just as the specific space required to house a library collection depends on the type of shelving used and the type of material stored there, so the exact amount of space needed for reader seating will vary depending on the type of seating. Seating at tables, for example, requires 25 square feet per seat, while seating in a lounge setting requires 40 square feet per seat. As a broad average, allow 30 square feet per seat.

Formula. For a general estimate of the space needed to provide adequate reader seating, multiply the number of projected seats by 30 square feet.

Example. Since Sampleville's design population is 12,000, the recommended number of seats per 1,000 population would fall somewhere between 7.00 and 4.50. For purposes of this estimate, planners assume a rate of 6.5 seats per 1,000 population, for 78 seats. At 30 square feet per seat, 2,340 square feet will be required for reader seating.

Step 3
Staff Work Space

Building or expanding a facility offers opportunities to reorganize relationships among existing work stations and to add new work stations to improve service to the community.

To determine the appropriate number of service points and appropriate staffing levels at each service point, examine present staff assignments and workloads. Examine trends in service patterns—increasing reference use or young adult use, for example. Compare local staffing patterns with those of neighboring libraries and other libraries of comparable size.

Examine each existing and prospective department or service area—circulation, technical services, reference, children's services, and so on. Determine if a service point is appropriate given present or anticipated workloads; if so, identify how many staff members are needed to meet the projected service need.

Note that this refers not to the number of individual employees or the number of full-time equivalents (FTEs) on the library payroll, but to the number of staff work stations needed to support the library's service program. Obviously, several different individuals can occupy a single work station at different times during the week. Conversely, it may be desirable to provide two or more work stations for certain employees. A children's librarian, for instance, may work at a public service desk part of the time and have a separate station or office away from that desk. Concentrating on work stations enables planners to focus on the tasks to be performed in a given area and how those tasks relate to other library operations.

A typical staff work station will require between 125 and 150 square feet. Some libraries may opt for the minimum allocation while others may opt for the more generous allocation. Larger libraries may find that the number of staff work stations that are needed to meet future service demands produce an economy of scale that permits efficiencies in the layout and design of staff work space that in turn allows them to apply the smaller space allocation. In practice, some work stations will likely be larger and others will likely be smaller. Final space allocations will be based on further evaluation of the specific routines to be accomplished at each work station and the amount of furniture and equipment necessary to support those routines.

Formula. To estimate the area needed for staff work space, multiply the number of work stations by 125 or 150 square feet.

Example. Planners in Sampleville identified eight work stations for an expanded facility—three in circulation (check-in/registration, check-out, book sorting); three in technical services (cataloging, typing, processing and mending); one for a future children's public service desk; and one for the director's office. Because Sampleville will likely be a smaller facility, planners also opted to apply the more generous space allocation for work stations. At 150 square feet per station, these eight stations require 1,200 square feet.

Step 4
Meeting Room Space

Many public libraries provide meeting rooms to accommodate library-sponsored programs and other community meetings. The number and size of meeting rooms should be determined by the library's anticipated programming activities and by the availability of similar rooms elsewhere in the community for use by other local groups.

There are four broad types of meeting room space commonly found in public libraries. General program space (with lecture hall or theatre seating), conference room space, and children's storytime space are found in many libraries, and increasingly libraries are choosing to provide dedicated space for a computer training lab.

Depending on the demands of its community, a library may have one or more general meeting or programming rooms. If the library provides no other space for meetings and programs, a general multi-purpose space will typically be the choice. In a smaller library, this kind of room can support general library programs, and board and committee meetings, and children's storytimes. The desired audience capacity will determine much of the space need here.

> **Formula.** In a general meeting room, a library should allow 10 square feet per audience seat, plus another 100 square feet for a speaker's podium / presentation area at the front of the room.

A conference room can alleviate the scheduling demands on the library's larger meeting room, freeing that room for other uses when the library board meets or another smaller group is scheduled to meet.

Formula. Assuming seating at a conference table, allow 25 square feet per seat. As a variation, allow 10 square feet per seat for any additional seating in a gallery or audience, if one is to be provided.

A storytime room likewise can alleviate the scheduling demands on the library's larger meeting room. Depending on the frequency of children's programming activities, a separate room for storytimes can be advantageous. A separate room also creates a chance to locate the room *within* the children's library, close to the material that the programming activity is meant to promote.

Formula. In a storytime room, allow 10 square feet per child, plus another 50 square feet at the front of the room for the program leader. As a variation, note that many children's programs include a craft activity, and if that is part of the library's plan of service, another 5 square feet per seat should be added to this allocation.

More and more libraries are setting aside dedicated space for a computer training lab for the public and staff. If the room is open for general use when there are no scheduled training sessions, it offers the advantage of expanding the number of computer work stations that are available to the public.

Formula. In a computer training lab, allow 50 square feet per station, plus another 80 square feet at the front of the room for the trainer.

Example. In Sampleville, planners reviewed the library's programming activities and assessed the availability of other meeting facilities in the community. They determined that the library ought to provide a general meeting room to seat 75—this room would also double as the board room—and a separate children's storytime room to seat 25. The library's typical storytime program includes a craft activity, so planners use an allocation of 15 square feet per seat in the storytime room.

The area needed for the meeting room is 850 square feet (75 * 10, plus another 100 square feet for the speaker). The area needed for the storytime room is 300 square feet (25 * 15, plus another 50 square feet for the storyteller).

The total area needed for meeting and programming functions is 1,150 square feet.

Step 5
Special Use Space

Special use space must be allotted for elements of an individual library's program of service or for special types of furnishings that have not been accounted for in earlier sections of this outline. For example, none of the four types of library floor space described thus far includes an allocation for index tables, newspaper racks, pamphlet files, microfilm readers, or photocopiers.

Special use space typically constitutes about 10 percent of the overall or gross area in a public library building, but depending on a library's anticipated service program, the allocation of special use space may be a little larger or a little smaller. Planners should consider whether a minimum, moderate, or optimum allocation is most suitable.

Formula. To calculate an allocation for special use space, add the allocations for the four preceding types of space, and divide that subtotal by 6 (for a minimum allocation of special use space), by 5 (for a moderate allocation), or by 4 (for an optimum allocation).

Example. Planners in Sampleville added their allocations for the four preceding types of library space, resulting in a subtotal of 10,830 square feet. They determined that a minimum allocation for special use space was desirable and so divided the subtotal by 6 to produce an allocation of 1,805 square feet for special use purposes.

As an alternative, Appendix B provides a list of representative furnishings and equipment and other types of special use space, along with sample space allocations for each. Planners can choose from that

list the type and number of special furnishings that will be required and total their respective space allocations. Although it will take more time to do this, it will result in an allocation for special use space that is based more directly on the library's projected program of service.

Step 6
Nonassignable Space

Nonassignable space is that portion of a building's floor space that cannot be applied or assigned directly to library service. Some representative types of nonassignable space are furnace rooms, janitor's closets, storage rooms, vestibules, corridors, stairwells, elevator shafts, and rest rooms. Such space is necessary to support the operation of the building, but it cannot be used directly for library service.

Nonassignable space generally comprises about 20 to 25 percent of the gross square footage of the finished building. The final allocation of nonassignable space will depend on the efficiency of the library design, the size of the project, whether the project involves new construction or alterations of an existing building, and possible site constraints, among other factors. A smaller building is more likely to have a larger proportionate nonassignable space allocation. Projects that involve the expansion or adaptation of an existing structure are also more likely to have a larger proportionate nonassignable space allocation.

A calculation in the next section, "Putting It All Together," includes an allocation for nonassignable space.

Step 7
Putting It All Together

The space needs estimates developed in Steps 1 through 5 for collection space, reader seating space, staff work space, meeting room space, and special use space can be added to derive a subtotal representing the projected assignable space needs for the library.

An estimate for nonassignable space can be drawn from this subtotal of assignable space need. If a minimum allocation for nonassignable space is preferred, divide the assignable subtotal by 4. If an optimum allocation for nonassignable space is preferred, divide the subtotal by 3.

Then add the estimates for each of the six types of library floor space to produce an estimate of the library's overall space needs.

Formula. To calculate an allocation for nonassignable space needs, divide the subtotal of assignable space by 4 (for a minimum allocation of nonassignable space), or by 3 (for an optimum allocation).

Formula. To determine the library's overall space needs, add the projections for each of the six preceding types of space.

Example. Library planners at Sampleville make an optimum allocation for nonassignable space. The allocations for the first five types of space are added together (12,635 square feet) and divided by 3, producing an estimate of 4,212 square feet for nonassignable purposes.

Planners then determined the library's overall space needs by adding the projections for each of the six types of space.

Collection space	6,140 sq.ft.
Reader seating space	2,340 sq.ft.
Staff work space	1,200 sq.ft.
Meeting room space	1,150 sq.ft.
Special use space	1,805 sq.ft.
Subtotal - assignable space	12,635 sq.ft.
Nonassignable space (optimum allocation)	4,212 sq.ft.
Gross area needed	16,847 sq.ft.

Step 8
The Next Steps

This outline should be completed from time to time, as changing estimates of the community's population and demographics warrant, but no less frequently than every five years. Once the outline is completed, library planners will have an estimate of their library's overall space needs. Comparison of this estimate with the existing facility may highlight a significant deficiency in the space the library provides.

If this procedure documents a need for expanded space, the next step should be a closer examination of this space needs assessment. Re-examine the planning assumptions that went into the estimates. Are the population projections reasonable? Will the collection actually grow to the anticipated size? Should more seating be provided, or less? Are there sufficient work stations? And so on ....

The space needs assessment can also be refined through more narrow examination of the six broad types of space. This is done by

- identifying collections and service areas that were not discussed in the context of the outline;
- classifying the broad types of space discussed in the outline into functional groups and arrangements; and
- specifying the unique environments and conditions to be found in the library.

Start by filling in gaps in the outline by identifying collections or service areas that were not covered in the outline. Microformats are one example of a collection that's not addressed directly through the outline process. There may also be one or more unique collections at

the library that are not captured through this process—the library may hold boxes of archival documents or a large photograph collection as part of a local history collection. These special holdings should be identified now and worked into the library's outline of space needs.

If planners determine the allocation for special use space with the formula in Step 5, this would be an appropriate time to use the representative types of special use space listed in Appendix B to determine an allocation for special use space that is based on the specific equipment, furnishings, and settings planners want to include in an expanded library.

Next, classify these general space needs into departments. While the outline discusses six broad, generic types of library space, the library will not likely organize its entire collection into one area, or arrange all of its reader seating or staff work stations into a single space. A building will be organized around certain functional areas appropriate to the roles and mission of an individual library. Each such area or department will probably draw from two or more of the general types of space addressed in this outline. A reference department is likely to include some collection space, some reader seating space, some staff work space, and some special use space for index tables, atlas stands, and other unique furnishings.

The projected collection resource may be allocated among departments. Once that is done, a rough estimate of the corresponding space need can be made using an allocation of one square foot for every 10 volumes to house.

Example. Sampleville's book collection was projected to grow to 42,000 volumes. After examining the library's service programs and goals, planners decided that the collection should be divided into these five areas.

Collection	Volumes	Sq.ft.
Adult nonfiction	16,000	1,600
Adult reference	2,000	200
Adult fiction	10,000	1,000

Children's picture books	5,000	500
Children's books	9,000	900
TOTAL	42,000	4,200

The other types of space can be subdivided as well—reader seating space, staff work space, special use space, and so on. At the end of this process, planners will have a space needs assessment organized around the library's functional areas.

Finally, as the departmental categories are developed and omissions corrected, the space needs assessment can be further refined by noting the effect of the unique environments preferred in each department. Special shelving requirements can be noted and space allocations adjusted to reflect them. Remember that the estimate of ten volumes per square foot is itself predicated on certain assumptions. The actual number of volumes that can be housed per square foot will vary based on factors such as

- the height of a typical shelving unit and the number of shelves it can house;
- the length of a typical shelf and how much of each shelf should be used under ordinary circumstances—the "working capacity" of a shelf is between 65 percent and 80 percent of its actual length;
- the type of material being shelved—that is, how many volumes can typically be shelved per linear foot of shelf space; and
- how wide the aisles are and how big the base shelf is—both factors help determine how much floor space a representative shelving unit occupies.

These factors can change in different parts of a collection. Children's material is often housed on lower shelves than adult material. Reference books usually are housed with fewer volumes per linear foot of shelving than other types of material. By considering these variations, planners can establish a much more accurate estimate of how many volumes per square foot can be housed in different parts of the collection.

Library planners should also remember that, for various parts of the collection, there will always be a portion out in circulation.

Example. Sampleville planners divided their library's 42,000 volumes into five broad segments. After examining circulation patterns, they determined a representative percentage in circulation for each segment of the collection.

Collection	Volumes	Pct circ	To house	Sq.ft.
Adult nonfiction	16,000	10%	14,400	1,440
Adult reference	2,000	0%	2,000	200
Adult fiction	10,000	15%	8,500	850
Children's picture books	5,000	15%	4,250	425
Children's books	9,000	10%	8,100	810
TOTAL	42,000		37,250	3,725

In a similar way, seating allocations in different departments can be examined more closely. Planners can determine how many seats should be provided at reading tables, how many at carrels, and how many in a lounge or browsing environment. The mix of table seating, carrel seating, and lounge seating will vary, depending on the library's service emphases and the atmosphere the planners are trying to create. After determining the best distribution of seating among typical seating environments, planners can multiply the number of seats at reading tables by 25 square feet, seats at study carrels by 30 square feet, and lounge seats by 40 square feet. This produces an even more accurate combined allocation for reader seating.

As the space needs are refined, planners should turn their attention to developing a written building program statement. Actually, by developing a space needs assessment to this point, planners will have completed much of the work involved with writing a building program.

A building program statement is a written summary of library service goals, projected space needs, and a vision of how departments or service areas within a library should interact to achieve those goals effectively. It will describe a library's long-term space needs. It will

identify the departments or service areas a library will require to accomplish its program of service, and it will describe what activities or routines will occur in each of those areas.

The building program statement will describe the necessary interrelationships among departments. It will describe other architectural requirements that planners wish to incorporate into an expanded facility, including general notes about lighting levels, accessibility, environmental controls, maintenance requirements, and so on. The architect will use a building program statement as a guide when developing plans for a library. The building program statement becomes a point of common reference between library planners and architect as they consider specific design options.

Wisconsin public library systems and the Division for Libraries and Community Learning can provide continuing assistance with the facilities planning process. Planners can also benefit from a review of the literature on library design and construction. A brief, selective bibliography can be found in Appendix C.

If this assessment demonstrates that an expansion project is recommended, library planners must be ready to embark on a most important mission—a building program. Few projects are as complex and rewarding as a building program, and few offer such an opportunity to shape a community's library services for years to come. Local planners across the country have met this challenge time and again. With conscientious effort, every library building planning team can respond successfully to the unique needs of its community for a facility to house library collections and services adequately and effectively.

Appendix A: Service Data for Wisconsin Public Libraries

As one outgrowth of the 1987 revisions to *Wisconsin Public Library Standards*, data gathered by the Division for Libraries and Community Learning each year from public libraries across the state in the public library annual report forms is now analyzed and reported out. Since 1995, the *Wisconsin Library Service Record*, the Division's annual summary of the public library report data, has included a new analysis of the public library annual report data. This appears in a chapter titled "Service Data for Wisconsin Public Libraries."

"Service Data" analyzes selected public library annual report data according to population category and calculates benchmark percentile measures for each population range. These analyses are distributed to the library community to provide library boards and staffs with another tool to assess where their library is in relation to peers. Through that assessment, boards and staffs also have an opportunity to chart their future course.

This appendix reprints several charts from the "Service Data" chapter of the *1996 Service Record*. The charts are reproduced here to help libraries define collection development goals in support of calculating space needs with this outline. The charts include

- volumes held per capita
- periodical titles received per 1,000 population
- audio recordings per 1,000 population
- video recordings per 1,000 population

As new editions of the *Service Record* appear, these charts will be updated with more current findings. Also note other valuable sources

of comparative library resource and use data: the Public Library Association and the National Center for Education Statistics. PLA gathers data from selected libraries annually and publishes the findings in *Statistical Report: Public Library Data Service*. The NCES works with state library agencies across the country to assemble the annual report data submitted by all of the nation's public libraries into one consolidated database, which is available via the Internet at the NCES's site.

	Population	n=	Basic	Moderate	Advanced
Volumes Held per capita	Less than 1,000	20	10.80	13.09	19.11
	1,000 to 2,499	92	5.80	6.80	7.94
	2,500 to 4,999	92	3.90	4.62	5.23
	5,000 to 9,999	67	3.87	4.19	4.53
	10,000 to 24,999	59	3.02	3.38	4.18
	25,000 to 49,999	24	2.75	3.01	3.32
	50,000 to 99,999	12	3.00	3.08	3.65
	100,000 and over	7	2.41	2.57	2.67

	Population	n=	Basic	Moderate	Advanced
Periodical Titles Received per 1,000 population	Less than 1,000	20	47.97	56.37	74.98
	1,000 to 2,499	92	20.08	24.46	32.11
	2,500 to 4,999	92	16.06	19.19	21.81
	5,000 to 9,999	67	13.81	14.97	16.55
	10,000 to 24,999	59	10.18	11.22	13.25
	25,000 to 49,999	24	7.87	8.84	9.88
	50,000 to 99,999	12	6.61	6.91	7.14
	100,000 and over	7	4.09	5.53	6.47

	Population	n=	Basic	Moderate	Advanced
Audio Recordings per 1,000 population	Less than 1,000	20	146.93	341.22	460.12
	1,000 to 2,499	92	95.68	133.70	211.55
	2,500 to 4,999	92	62.78	87.24	136.32
	5,000 to 9,999	67	98.86	120.94	146.45
	10,000 to 24,999	59	94.25	117.12	177.65
	25,000 to 49,999	24	105.98	116.70	139.96
	50,000 to 99,999	12	127.43	165.30	182.06
	100,000 and over	7	93.18	112.63	137.83

		Population	n=	Basic	Moderate	Advanced
	Video Recordings	Less than 1,000	20	795.29	1,083.97	1,187.46
	per 1,000	1,000 to 2,499	92	156.78	215.27	344.52
	population	2,500 to 4,999	92	111.35	155.83	191.87
		5,000 to 9,999	67	96.48	107.18	139.33
		10,000 to 24,999	59	70.94	99.27	127.57
		25,000 to 49,999	24	64.06	74.96	105.21
		50,000 to 99,999	12	82.56	91.72	95.99
		100,000 and over	7	42.46	55.03	64.09

Appendix B: Representative Types of Special Use Space

This appendix provides a highly selective listing of types of special use furnishings and their corresponding space allocations. To define a library's special use space needs, planners can use the assessment formulas provided in Step 5, "Special Use Space," above or they can apply the individual, specific space allocations found here.

By examining the library's program of service, planners can identify an inventory of special use furnishings that will be required to support the library's services and operating routines, then add together the individual space allocations for the various elements of special use space.

This list is by no means complete. To devise a space allocation for types of equipment or furnishings not found on this list, planners are encouraged to interpolate an allocation from comparably-sized items below. This list draws from the recommendations published in *Building Blocks for Library Space: Functional Guidelines - 1995* (Chicago: Library Administration and Management Association, 1995). For further information on suitable space allocations for individual items that might be housed in the library, refer to that publication.

Item	**Space allocation**
Atlas / folio case	36 square feet
Book return / free-standing	16 square feet
CD-ROM station	45 square feet
Dictionary stand	25 square feet
Display rack, wall-mounted	9 square feet
Display rack, free-standing	20 square feet
Display spinner (for paperbacks,	

special nonprint, etc.)	42 square feet
Index table	150 square feet
Lateral filing cabinet	15 square feet*
Listening station / individual	40 square feet
Map case	56 square feet
Microfilm/fiche reader-printer	36 square feet
Mircoform storage cabinet	18 square feet
Photocopying machine	52 square feet
Recycling container	6 square feet
Small-group study room	30 square feet per seat
Display case	50 square feet
Newspaper rack	25 square feet
Public typewriter	35 square feet
Staff lounge	80 square feet, plus 30 square feet per seat**

* Note that files come in two-, three-, four-, or five-drawer units. The number of cabinets the library will need is measured by the total number of drawers needed divided by the number of drawers per unit.

** This anticipates space for a small kitchenette (80 square feet) and seating at a table or tables (30 square feet per seat); a staff lounge to accommodate six would require 260 square feet (80 + (6 x 30) = 260).

Appendix C: Selected Bibliography

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Appendix D:
Space Needs Worksheet

NOTE: An Excel workbook based on this worksheet can be downloaded from the Division's web site.

Design population

a. Current population of the municipality / primary service area: ……_____
b. Projected popualtion of the municipality / primary service area:……_____
c. Estimate of nonresident service population.……_____
d. Design population (b+c) ……_____

Step 1: Collection space

a. Books _____ volumes ÷ 10……_____sq.ft.
b. Periodical (display) _____ titles ÷ 1 ……_____sq.ft.
c. Periodical (back issues) _____ titles x 0.50 x ____ yrs retained ……_____sq.ft.
d. Nonprint _____ items ÷ 10……_____sq.ft.
e. Digital resources _____ terminals x 50……_____sq.ft.
f. Total (a+b+c+d+e) ……_____sq.ft.

Step 2: Reader seating space

a. _____ seats x 30 ……_____sq.ft.

Step 3: Staff work space

a. _____ stations x 150 (list specific work stations on reverse)……_____sq.ft.

Step 4: Meeting room space

a. General meeting space _____ seats x 10 (plus 100 sq.ft. for speaker)..…_____sq.ft.
b. Conference room space _____ seats x 25 ……_____sq.ft.
c. Storytime space _____ seats x 10 (plus 50 sq.ft. for speaker)….…_____sq.ft.
d. Total (a+b+c) ……_____sq.ft.

Step 5: Special use space

a. Collection space (from 1.f) ……_____sq.ft.
Reader seating space (from 2.a) ……_____sq.ft.
Staff work space (from 3.a) ……_____sq.ft.
Meeting room space (from 4.d) ……_____sq.ft.
b. SUBTOTAL 1 ……_____sq.ft.
c. Divide Subtotal 1 by 6 (for a minimum allocation), by 5 (for a moderate allocation), or by 4 (for an optimum allocation) ……_____sq.ft.

Step 6: Nonassignable space

a. Subtotal 1 (from 5.b) ……_____sq.ft.
Special use space (from 5.c) _____sq.ft.
b. SUBTOTAL 2 ……_____sq.ft.
c. Divide Subtotal 2 by 4 (for a minimum allocation, or by 3 (for an optimum allocation) ……_____sq.ft.

Step 7: Putting it all together

a. Collection space (from 1.f ……_____sq.ft.
b. Reader seating space (from 2.a)……_____sq.ft.
c. Staff work space (from 3.a) ……_____sq.ft.
d. Meeting room space (from 4.d)……_____sq.ft.
e. Special use space (from 5.c) _____sq.ft.
f. Nonassignable space (from 6.c)……_____sq.ft.
g. GROSS AREA NEEDED (a+b+c+d+e+f)……_____sq.ft.

Staff work stations

List here the staff work stations tallied and reported in Step 3:

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

Notes: